REMARKS

Claims 1-4, 7-15, and 18-29 are all the claims pending in the application, claims 5, 6, 16, and 17 having been canceled in previous amendments.

Applicant acknowledges with appreciation that claims 27-29 would be allowable if rewritten in independent form, including all of the limitations of their respective rejected base claims. However, at this time, Applicant respectfully declines this offer in view of the arguments presented herein.

As Applicant can best ascertain, claims 1-4, 7-15, and 18-26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sgroi (U.S. patent 5,357,048) in view of Longo (U.S. patent 6,066,794) and Smith et al. (U.S. patent 6,018,118). Sgroi and Smith have been cited in previous Office Actions, and Longo is a newly cited reference.

Applicant notes that the §103 rejection set out on page 2 of the Office Action refers to the Gruenbaum patent, which was a patent asserted in the previous Office Action in this application. However, the text of the rejection on page 4 of the Action does not refer to Gruenbaum, but instead refers to the newly cited Longo patent. Applicant assumes that the repeat of the initial reference to the Gruenbaum patent on page 2 of the Action was in error as arguments were presented against Gruenbaum, and that the rejection was thus intended to refer to the newly cited Longo patent. Applicant further notes that the §103 rejection on page 2 of the Action does not refer to claims 21-26, but Applicant assumes that these claims have also been rejected since they are specifically addressed with respect to the Longo reference on page 5 of the Action. With this understanding of the Office Action, Applicant respectfully traverses these rejections, and requests reconsideration and allowance of the pending claims in view of the following arguments.

Figure for Cover Sheet

As a preliminary matter, should the Examiner deem the claims of the present application to be allowable, Applicant respectfully requests that Figure 67 be used as the figure for the cover sheet on the issued patent. The Examiner is invited to telephone the undersigned to discuss alternative figures should it be necessary.

Applicant further notes that the application was published with the figures printed in duplicate. Applicant respectfully requests the Examiner's assistance in correcting this matter so that any patent issuing from the present application will only contain a single copy of the figures.

Rejection of claims 1-4, 7-15, and 18-26 Under 35 U.S.C. §103(a)

To establish a *prima facie* case of obviousness, the Examiner bears the burden of demonstrating that (1) there is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there is a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Importantly, "[t]he teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicant's disclosure." MPEP § 2143.

Claims 1 and 2

With regard to independent claims 1 and 2, the Examiner continues to maintain that Sgroi teaches each of the claim limitations except for the use of a control signal generator that is either a

low frequency oscillator (LFO) or a transient generator (Office Action, pg. 4). In the previous Office Action (March 29, 2004), the Examiner relied upon Smith to remedy this deficiency of Sgroi. In the present Action, the Examiner again states that Smith teaches a LFO as recited in these claims (Office Action, pg. 5-6). The Examiner then goes on to assert that Longo teaches a transient generator (Office Action, pg. 4). Applicant will demonstrate that, *inter alia*, neither Smith nor Longo provide the requisite teaching as asserted in the Office Action.

Longo Does Not Teach a Transient Generator

On page 4 of the Action, the Examiner asserts that the gesture synthesizer 210 in figure 2 of the Longo patent discloses a transient generator as recited in Applicant's claims 1 and 2. Longo discusses figure 2 starting in col. 12, line 8, and continuing to col. 14, line 7. Applicant has reviewed figure 2 and the associated text and is unable to locate any description which supports the Examiner's conclusion that the gesture synthesizer 210 is a transient generator. To the contrary, the whole point of gesture synthesizer 210 is to generate "gestures as wave-like cyclic phenomena." (Longo, col. 13, lines 35-36).

The various controller displacement and velocity values presented to gesture synthesizer 210 are used to activate and control a chain of gesture synthesis modules, as depicted in figure 4 (Longo, col. 15, lines 6-11). If gesture synthesizer 210 does indeed disclose a transient generator, as asserted in the Office Action, then one or more of the various modules of figure 4 must therefore provide this feature. Applicant has reviewed the disclosure associated with each of these modules comprising figure 4 and is unable to find any teachings relating to a transient generator.

The only module which could even remotely resemble a transient generator is time oscillator module 500, which is shown in more detail in the generalized block diagram of figure 14A.

(Longo, col. 19, line 18-19). Applicant's review of this portion of the reference finds that module 500 models the response of muscles to an internal electrical stimulus. (Longo, col. 19, lines 22-24). Muscle stimulus and response is modeled using figures 15A and 15B. After a careful review of the disclosure associated with time oscillator module 500, and figures 15A and 15B, Applicant is unable to find any teachings relating to a transient generator. The waveforms generated by the time oscillator module 500, shown in figures 15A and 15B, would not be recognized by one skilled in the art as an LFO nor as a transient generator but rather as something else entirely.

Thus, Applicant submits that Longo does not teach or suggest a transient generator as recited in independent claims 1 and 2. Consequently, even if the teachings of Sgroi, Longo and Smith were combined, the resulting system would not teach or suggest all of the claim limitations of claims 1 and 2. Because all the claim limitations of claims 1 and 2 are not taught or suggested by Sgroi, Longo, and Smith, Applicant submits that the Examiner has failed to make out a *prima facie* case for obviousness. Accordingly, these independent claims, and their respective dependencies, claims 3-4 and 7-14, are believed to be patentable.

In the present Office Action, the Examiner further states that Smith teaches a low frequency oscillator (LFO), and that it would have been obvious to one of ordinary skill to utilize the teachings of Smith and Sgroi to arrive at the invention recited in independent claims 1 and 2 (Office Action, pg. 5-6). This is the *identical* basis for rejection that was presented in the last Office Action in this application (March 29, 2004, Office Action, page 5). Applicant has addressed this rejection in its last response (May 17, 2004). However, page 7 of the instant Office Action indicates that Applicant's previous arguments have been considered but are moot in view of the new grounds of rejection. Applicant notes that the same reference (Smith) is being used to reject the same claims 1 and 2 (and their respective dependencies), and that the grounds for such rejections is the same as the

previous Office Action. Accordingly, Applicant submits that the arguments provided in the previous Response (May 17, 2004) are not moot as indicated in the present Action. For the convenience of the Examiner, Applicant provides below its comments which were originally presented on pages 10-14 of Applicant's Response filed on May 17, 2004. Consideration of the following is respectfully and earnestly requested.

Smith Does Not Teach a Controllable LFO

With regard to independent claims 1 and 2, the Examiner asserts that Sgroi teaches each of the claim limitations except for the use of a control signal generator that is either a low frequency oscillator (LFO) or a transient generator (Office Action, pg. 2). The Examiner relies upon Smith to remedy this deficiency of Sgroi, stating that Smith teaches a LFO as recited in these claims. Applicant respectfully disagrees.

Smith is directed to a signal mapping system that maps sensor signals into control signals that control the operation of a music synthesizer (Smith, Abstract). Applicant's review of the cited portions of this reference reveals that the Smith device has a number of sensors which, in combination with sensor signal reading circuitry 104, generate sensor signals (Smith col. 4, lines 11-19) which may be offset by the value of a time-varying LFO, if any, assigned to the note (Smith col. 5, lines 54-55). As shown in Fig. 1, system signal mapper 110 maps these sensor signals (six force-sensitive resistor signals in addition to drum and pedal signals), into control parameters for music synthesizer 112 (Smith col. 4, lines 52-55).

Applicant first assumes *arguendo* that, as asserted in the Office Action, signal mapper 110 teaches a LFO control signal generator. Under this assumption, Smith therefore provides, at best, teachings of a time-varying LFO control signal generator that produces values independently of the sensor signals (Smith, Figure 1). However, and more importantly, Smith contains absolutely no teachings relating to a LFO that is controlled by control signals. This is in contrast to the invention of claims 1 and 2 where one purpose is to create LFO or transient-generator signals (or both) that are explicitly responsive to incoming control signals. The whole purpose of Smith, instead, is to simply map sensor signals into control parameters for a musical synthesizer (Smith col. 4, lines 52-55), permitting an LFO value to be added in. Accordingly, Applicant submits that Smith does not teach or suggest a control signal generator that operates in response to an "incoming control signal," as recited in independent claims 1 and 2. As a result, even if the teachings of Sgroi and Smith were combined, the resulting system would not teach or suggest all of the claim limitations of claims 1 and 2.

Another distinguishing feature of claims 1 and 2 is that the LFO of Smith

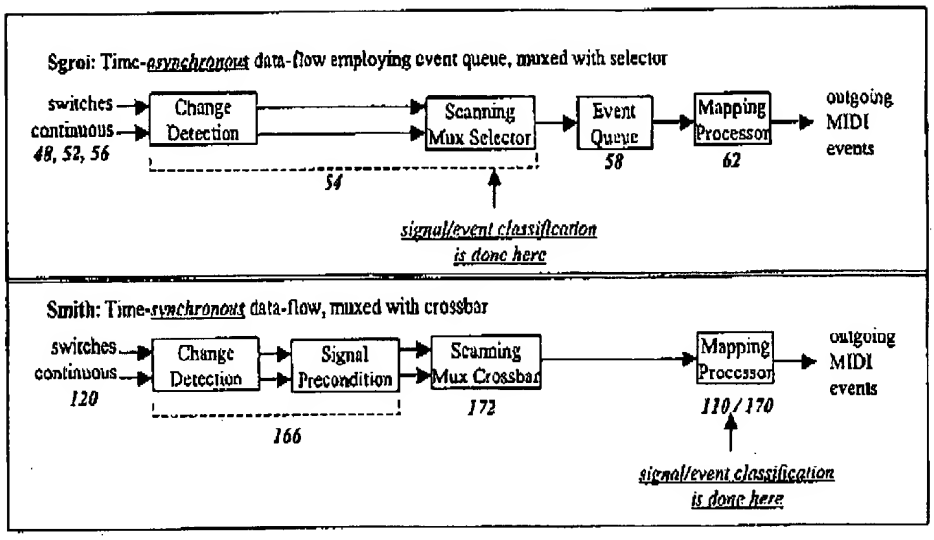
does not have the "associated control events and parameters" required by these claims. However, even if Smith did provide such a teaching, this reference lacks any teaching or suggestion for controlling such control events and parameters using an "incoming control signal." This is, again, because the LFO of Smith does not operate in response to an "incoming control signal," as described above. Applicant further notes that Gruenbaum, used only to provide an example of a MIDI input, does not remedy any of the deficiencies of Smith as Gruenbaum and provides no teaching of controlling an LFO or transient generator with an incoming control signal.

Because all the claim limitations of independent claims 1 and 2 are not taught or suggested by Sgroi, Smith, and Gruenbaum, Applicant submits that the Examiner has failed to make out a *prima facie* case for obviousness. Accordingly, these independent claims, and their respective dependencies, claims 3-4 and 7-14, are believed to be patentable.

No Suggestion To Combine the Teachings of Sgroi and Smith

Not withstanding the above, Applicant further notes that it is well established that if the "proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *See* M.P.E.P. § 2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)). Furthermore, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *See* M.P.E.P. § 2143.01 (citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)).

First of all, Applicant recognizes that there are some high-level similarities between the Sgroi and Smith systems. For instance, both systems: accept non-MIDI switch signals (including panel switches and keyboard keys) and non-MIDI continuous signals (including sensors and potentiometers); detect changes in such signals; multiplex these signals using a scanning procedure; apply a mapping within a processor; and produce outgoing MIDI signals using a mapping processor. Both systems are in contrast to the invention of claims 1 and 2 which recite a processor that utilizes incoming MIDI control signals to generate outgoing MIDI signals.



The above diagram depicts the contrasting architecture and signal flow through the Smith and Sgroi systems. Clearly, these systems function using entirely different operating modes— the Sgroi system utilizes a time-asynchronous data flow, whereas the Smith system relies upon time-synchronous data flow.

Looking first at Sgroi, this system implements a conventional time-asynchronous architecture and as such must include an event queue 58 since the processor's ability to respond to a newly detected switch or continuous signal change depends upon the progress through the various extensive conditional paths and loops depicted in Figs. 5, 6, and 8A- 12. Further, the Sgroi scanning multiplexer 54 classifies events in the event queue before mapping occurs at processor 62. It is well known that a time-asynchronous system, such as Sgroi, requires some sort of event queue such as event queue 58.

In contrast, the Smith system is explicitly time-synchronous (Smith col. 7, lines 28-51) and relies on this time-synchronous architecture to accurately route as-yet unclassified signals through the scanning multiplexing crossbar 172 to permit a one-to-many mapping (Smith col. 8, lines 2-8 and 34-44; and col. 13, lines 34-54). In further contrast, signal/event classification (as a result of the one-to-many provision) occurs in the mapping processor 110/170.

In the Office Action, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to replace the control signal generator of Sgroi with the LFO control signal generator of Smith (Office Action pg. 5). Applicant submits that the Sgroi and Smith systems implement signal flow timing architectures and signal/event classifications which are handled using entirely incompatible techniques. The Sgroi system and Smith systems are architecturally incompatible and therefore incapable of being combined.

Nevertheless, even if such a combination were possible, the resulting system would be one in which the time-asynchronous Sgroi system would generate MIDI output using the LFO of the time-synchronous Smith system. Even if such a system were functional, such a modification would require a fundamental change in the operational characteristics of the Sgroi system (from a "time-asynchronous" system to a "time-synchronous" system). Under these circumstances, M.P.E.P. § 2143.01 unambiguously supports a finding of a lack of suggestion or motivation to modify Sgroi with the teachings of Smith. Therefore, independent claims 1 and 2, and their respective dependencies, claims 3-4 and 7-14, are believed to be patentable for these additional reasons.

Claim 15

No Suggestion to Combine Sgroi and Longo

Turning now to independent claim 15, a method is recited in which first and second incoming control signals comprise MIDI messages. In the Office Action, the Examiner recognizes the shortcomings of Sgroi and acknowledges that this reference does not teach MIDI input (Office Action, pg. 4). However, the Examiner declares that Longo provides MIDI input, and that one of ordinary skill in the art would have utilized the teachings of Sgroi and Longo to arrive at the method recited in claim 15. The purported suggestion for such a combination, as presented on page 6 of the Office Action, is that Longo allows MIDI input to be processed; and that the Sgroi system processes signals generated by a keyboard, and such keyboards commonly provide MIDI. Applicant submits that even if Longo discloses a method involving MIDI input, Longo (or any other reference of record) does not provide a suggestion or motivation to modify Sgroi in the manner asserted to arrive at the signal generating method recited in Applicant's claim 15.

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary

skill in the art." MPEP § 2143.01 (citing *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998). To reiterate, "[i]f [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." MPEP § 2143.01. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. MPEP § 2143.01.

"The mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP 2143.01 (Citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original)). With this in mind, Applicant assumes *arguendo* that the teachings of Sgroi and Longo can be combined in the manner asserted in the Office Action. Such a system would be one in which the Sgroi scanner 54 receives MIDI control signals from keyboard 56 (Sgroi Figure 4). Even if such a system were possible, Sgroi provides absolutely no teaching relating to the processing of MIDI control signals generated by keyboard 56. That is, even if keyboard 56 could generate MIDI control signals, as the Examiner proposes, the various subsequent components comprising the Sgroi system are unable to process these MIDI signals.

Applicant agrees that the Sgroi system provides some amount of signal processing, but such processing is limited to the manipulation of non-MIDI signal data. For example, as shown in Fig. 4, the Sgroi system includes the following components: scanner 54, event compiler 58, element memory 60, randomizer 64, and processor 62. None of these components, individually or collectively, process incoming MIDI control signals.

Looking in more detail at scanner 54, the specification states that the primary function of scanner 54 is to "generate Events" (Sgroi col. 4, lines 12-14). An "Event" is a change of input state from which "MIDI commands will be generated" (Sgroi col. 4, lines 19-21). This means that scanner 54 is a device that generates signals (Events) which will later be used to generate MIDI signals. Absolutely no MIDI signal processing is taking place at scanner 54.

Additional components of the Sgroi system include: element compiler 58, which is a first-in-first-out (FIFO) buffer containing Event data (Sgroi col. 4, lines 17-18); element memory 60, which is a device used to store element data (Sgroi col. 4, lines 55-62); and randomizer 64, is a random number generator (Sgroi col. 7, lines 1-3). None of these components process nor handle MIDI control signals.

Lastly, processor 62 is a device that "implements a series of subroutines which converts Events into MIDI commands" (Sgroi col. 5, lines 1-2). As noted above, an "Event" is a change of input state from which "MIDI commands will be generated" (Sgroi col. 4, lines 19-21). Processor 62 is simply a device that converts non-MIDI data into MIDI commands.

Each of the various components comprising the Sgroi system would require substantial modification to be capable of processing MIDI signals. Processing of MIDI signals requires specific components and protocols, none of which are present is the disclosed Sgroi system. Moreover, the proposed modification would needlessly require the high overhead of assembly of MIDI messages in one component only to immediately disassemble it in a subsequent component, all to convey a simple numerical value which can readily be passed within and among co-executing loops or algorithms with no such needless overhead. Such modification would completely change how the Sgroi system operates. Under such circumstances, MPEP § 2143.01 requires a finding that the cited references are not sufficient to render claim 15 *prima*

facie obvious. Accordingly, claim 15, as well as its dependent claims 18 and 19, are believed to be patentable.

Claim 20

Page 2 of the Office Action sets forth the basis for the rejection to independent claim 20. Specifically, the Action states that claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over Sgroi in view of Longo and Smith. Page 5 of the Action discusses the purported teachings of Longo as disclosing each and every feature of claim 20. However, the Office Action does not provide any discussion relating to the teachings of Sgroi or Smith with respect to claim 20. As such, Applicant is unsure how the Examiner has combined the teachings of Sgroi, Longo, and Smith to arrive at the method recited in claim 20. Clarification on how the cited references are being applied to claim 20, and its dependencies, claims 23-26, is respectfully requested.

No Suggestion to Combine Sgroi and Longo

To facilitate the prosecution of the instant application, Applicant assumes for the sake of argument that the teachings of Sgroi and Longo have somehow been combined to arrive at the invention recited in claim 20. However, Applicant has demonstrated in the comments above with respect to claim 15, that no suggestion exists for the combination of these references. Specifically, modifying the Sgroi system with the MIDI teachings of Longo would completely change how the Sgroi system operates. As such, MPEP § 2143.01 requires a finding that the cited references are not sufficient to render claim 20 *prima facie* obvious. Further, neither Sgroi (as set forth in the last Response), nor Longo (as discussed below) teach required aspects of claims 20 and 23-26.

Longo Fails to Teach Required Aspects of Claims 20 and 23-26

In addition to the above, Applicant provides the following comments regarding the purported teachings of Longo with respect to the various message conversation methods recited in claims 20 and 23-26.

It is well known that in the MIDI protocol, MIDI note number values and MIDI note velocity values are only available in MIDI note on/off messages. In Longo, the only incoming MIDI note on/off messages are being generated by keyboard 30. However, as clearly depicted in Figure 2, none of the MIDI note on/off messages are received by any component within the Longo system that can generate outgoing MIDI control signals. Indeed figure 2 shows a signal path leading from keyboard 30, through signal generator 20, adder 272, tone generator 60, resulting in non-midi output communicated to speaker 110. Notably, signal generator 20 can only generate MIDI note on/off messages (Longo, col. 13, lines 59-63). Nowhere does Longo teach or suggest that signal generator 20, or any other component, generate MIDI continuous controller values from incoming MIDI note messages. At best, Longo would provide the changing of a MIDI note on/off message to an outgoing audio signal. Longo does not, however, teach the changing of an incoming MIDI note number value or MIDI note velocity value to an outgoing MIDI continuous controller value as recited in the first and second Markush elements of claim 20, and in claims 23 and 24.

As to the third and forth Markush elements of claim 20, again, the only entity in the Longo system that could possibly generate MIDI note on/off messages is signal generator 20. For Longo to teach the third Markush element of claim 20, signal generator 20 or other entity would have to change an incoming MIDI continuous controller value to an outgoing MIDI note

value. The only input to signal generator 20 is provided by keyboard 30. However, this input is a MIDI note on/off value, not a continuous controller value. Further, nowhere does Longo teach or suggest that signal generator 20, or any other entity, generate MIDI note velocity values even in response to incoming MIDI continuous controller signals. Thus there is no teaching or suggestion in Longo of changing an incoming MIDI continuous controller value to an outgoing MIDI note value as recited in the third Markush element of claim 20, and in claim 25.

The message conversion methods recited in the fourth Markush element of claim 20, and in claim 26, are not taught or suggested by Longo for similar reasons. For example, the Office Action appears to rely upon scale module 800 as teaching the changing of an incoming MIDI continuous controller value to an outgoing MIDI continuous controller value with scaling (Office Action, pg. 5; see also Longo, col. 31 line 23 through col. 32 line 51; and col. 40 line 12 though col. 41 line 11). However, the identified description in Longo clearly states that the scaling operation is only applied to pitch bending (Longo, col. 31 lines 24-43; and col. 40 lines 14- 27). This is further confirmed by Figure 2, which depicts "continuous pitch data" directed to the merging element 272 and as "MIDI out." Yet further confirmation (without an explicit MIDI out component) is shown in the gesture chain of Figures 3 and 4. Specifically, figure 4 shows the Longo scale module 800 creating a signal that (via delay module 900 or directly by bypassing the delay module) feeds the adder 290 of Figure 3, which in turn is explicitly shown as producing "pitch information" output. However, as is well known, pitch bending does not use MIDI continuous controller messages but rather MIDI pitch bend messages. These are different message types having explicitly different message type indicators (in hexadecimal, "B" and "E" respectively) in the MIDI protocol standard:

- MIDI continuous controller (a.k.a. "control-change") messages have the format

"0xB0" through "0xBF" (where x is the MIDI channel number); and

- MIDI pitch bend (a.k.a. "pitch-bend-change") messages have the format "0xE0" through "0xEF" (where x again is the MIDI channel number).

Applicant further notes that the remaining Markush elements of claim 20 are not taught or suggested by Longo. This is recognized by the Examiner in the Office Action since claims 27-29 have been indicated as allowable, and the various elements of these claims recite message conversions methods which are similar to the fifth, sixth, and seventh Markush elements of claim 20. In view of the forgoing, independent claim 20, and its dependencies, claims 23-26, are believed to be patentable.

CONCLUSION

The Examiner's rejections having been overcome, Applicant submits that the subject application is in condition for allowance. Should any issues remain unresolved, the Examiner invited to telephone the undersigned attorney.

Respectfully submitted,

LESTER F. LUDWIG

By: Jeffrey J. Lotspeich
Attorney for Applicant
Registration No. 45,737

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THE MAXHAM FIRM
750 'B' STREET, SUITE 3100
SAN DIEGO, CALIFORNIA 92101
TELEPHONE: (619) 233-9004
FACSIMILE: (619) 544-1246